

3

4 wherein X_1 , X_2 and X_3 each is a hydrogen atom; and5 x , y and z each is 0;

6 a polyiso(thio)cyanate compound, and a compound having two or more reactive
7 unsaturated groups and neither a hydroxyl group nor a mercapto group in an amount
8 of 30 to 70% by weight based on the total weight of the composition.

1 81. The sulfur-containing urethane resin composition according to claim 80
2 wherein the amount of the compound having two or more reactive unsaturated
3 groups is in the range of 30 to 50% by weight based on the total weight.

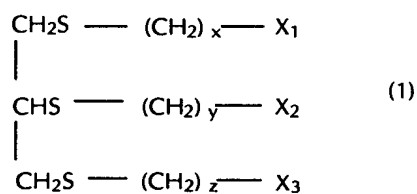
1 82. The sulfur-containing urethane-based resin composition according to claim 80
2 which contains another polythiol compound or a thiol compound having a hydroxyl
3 group in addition to the polythiol of the formula.

1 83. The sulfur-containing urethane resin composition according to claim 82
2 wherein the polyiso(thio)cyanate compound, the compound having the reactive
3 unsaturated groups, the polythiol of the formula, and the other polythiol compound or
4 the thiol compound having the hydroxyl group is such that a functional group molar

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ratio of { the iso(thio)cyanate group + the reactive unsaturated group } / { the mercapto group + the hydroxyl group } is in the range of 1.0 to 3.0.

84. A sulfur-containing urethane resin composition which comprises a polythiol compound represented by formula (1):



wherein X_1 , X_2 and X_3 each is a hydrogen atom; and x , y and z each is 0; a polyiso(thio)cyanate compound, and a compound having two or more reactive unsaturated groups and neither a hydroxyl group nor a mercapto group in an amount of 10 to 70% by weight based on the total weight of the composition, and a photopolymerization catalyst.

85. The sulfur-containing urethane resin composition according to claim 84 wherein the amount of the compound having two or more reactive unsaturated groups is in the range of 30 to 50% weight based on the total weight.

86. The sulfur-containing urethane resin composition according to claim 84 which contains another polythiol compound or a thiol compound having a hydroxyl group in addition to the polythiol of the formula.

1 87. The sulfur-containing urethane resin composition according to claim 86
2 wherein the polyiso(thio)cyanate compound, the compound having the reactive
3 unsaturated groups, the polythiol of the formula and the other polythiol compound or
4 the thiol compound having the hydroxyl group is such that a functional group molar
5 ratio of {the iso(thio)cyanate group + the reactive unsaturated group }/{ the mercapto
6 group + the hydroxyl group } is in the range of 1.0 to 3.0.

1 88. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 80.

1 89. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 81.

1 90. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 82.

1 91. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 83.

1 92. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 84.

1 93. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 85.

1 94. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 86.

1 95. A sulfur-containing urethane resin obtained by polymerizing the composition
2 of claim 87.

1 96. An optical element which comprises the resin of claim 88.

1 97. An optical element which comprises the resin of claim 89.

1 98. An optical element which comprises the resin of claim 90.

1 99. An optical element which comprises the resin of claim 91.

1 100. An optical element which comprises the resin of claim 92.

1 101. An optical element which comprises the resin of claim 93.

1 102. An optical element which comprises the resin of claim 94.

1 103. An optical element which comprises the resin of claim 95.

1 104. A lens which comprises the optical element of claim 96.

1 105. A lens which comprises the optical element of claim 97.

1 106. A lens which comprises the optical element of claim 98.

1 107. A lens which comprises the optical element of claim 99.

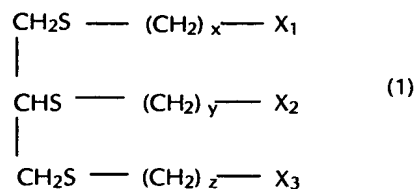
1 108. A lens which comprises the optical element of claim 100.

1 109. A lens which comprises the optical element of claim 101.

1 110. A lens which comprises the optical element of claim 102.

1 111. A lens which comprises the optical element of claim 103.

1 112. A process for preparing a sulfur-containing urethane resin which comprises a
2 step of curing by irradiating UV rays or visible rays a sulfur-containing urethane resin
3 composition comprising a polythiol compound represented by formula (1):



wherein X_1 , X_2 and X_3 each is a hydrogen atom; and x , y and z each is 0; a polyiso(thio)cyanate compound, and a compound having two or more reactive unsaturated groups and neither a hydroxyl group nor a mercapto group in an amount of 10 to 70% by weight based on the total weight of the composition.

113. A sulfur-containing urethane resin which is obtained by the process of claim

112.

114. An optical element which comprises the resin of claim 113.

115. A lens which comprises the optical element of claim 114. - -

REMARKS

The subject application is a continuation application of parent application Serial No. 08/425,958 filed on April 19, 1995. In the parent application conflicting subject matter was indicated with U.S. Patent No. 5,736,609 ('609) issued April 7, 1998 to Irizato et al. and assigned to Mitsui Toatsu Chemicals, Inc. To overcome said conflicting claims, the claims in the parent application were amended to specifically exclude the type of polythiol monomer defined and claimed in the '609 patent. A